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REMARKS

This is a Supplemental Preliminary Amendment referenced in the Preliminary Amendment filed on 10/14/2003.

Herein, the "Action" or "Office Action" or "Office" refers to the Office Action dated February 27, 2003 for the parent case.

Applicant respectfully requests entry of the above amendment prior to examination. Claims 4, 8, 11, 16-22, and 23-31 are presently pending. Claims amended herein are 1, 3, 4, 16-19, 22, 23, 30. Claims withdrawn herein are 31. New claims added herein are none.

Specification

In accordance with objections in the parent case, Applicant amends the specification herein.

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Substantive Claim Rejections

Claim Rejections under §102 and §103

The Office rejects all pending claims under §102 and §103. For the reasons set forth below, the Office has not made out shown anticipation (i.e., §102). Likewise, for the reasons set forth below, the Office has not made out a *prima facie* case of obviousness (i.e., §103). Accordingly, Applicant respectfully requests that the rejections be withdrawn and the case be passed along to issuance.

The Office's rejections are based upon one or more of the following references:

- **Arefi**: *Arefi et al.*, "Automatically Generating Visual Syntax-Directed Editors," March 1990, Vol. 33, No. 3, Communications of the ACM, pages 349-360;
- **Moshfeghi**: *Moshfeghi*, US Patent No. 6,476,833;
- **Hao:** *Hao et al.*, US Patent No. 6,377,287;
- **Ohsuga:** *Ohsuga*, US Patent No. 6,171,109;
- **Bentley:** *Bentley et al.*, US Patent No. 6,063,128;
- **Koenig:** *Koenig*, US Patent No. 5,530,957.

The Application

The Application describes a graph data structure technology employing a "spider cursor" for referencing a subset of data contained in a graph data structure.

The spider cursor may be described as having many legs, each touching exactly one node or link in the graph. Each leg has the ability to be raised to

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inspect what is underneath and the legs have the ability to be moved according to rules programmed into the spider cursor. Collectively, these legs represent a position within the graph. To continue the example, to be "positioned" on an address that has five thousand street numbers, the spider would have five thousand legs, each one touching one of the street number nodes in the graph. Based on the spider leg position, that complex address could then be examined, modified or deleted, just like a row indicated by a cursor in a conventional database table.

A conventional database row set cursor keeps track of the current position in a result set returned by a database query. In contrast, the Application describes a technology where a "spider cursor" keeps track of the current position in a directed labeled graph (DLG).

This is distinguished from keeping track of a position in a conventional database row set, because the graph over which a cursor operates can have an arbitrarily complex shape. Further, in the present invention, navigation can be on any of the spider's "legs", whereas in a traditional database cursor the navigation is limited to whole rows.

A cursor object is commonly created with a constraint graph that defines the subset of the graph over which the cursor object can traverse. A cursor object that has no constraint graph can access any schema or instance data in the spider.

In one aspect of the technology, described in the Application, a DLG that consists of any one or all of conceptual schemas, metaschemas, and instance data is managed by generating a spider cursor of the directed labeled graph and navigating through the directed labeled graph using the spider cursor.

The Application describes an aspect of the technology where a graph is managed by generating a cursor of the graph and navigating through the graph

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using the cursor. The cursor is associated with a constraint graph that identifies a subset of the collection.

The constraint graph is created or generated by obtaining a handle to a required namespace node, which yields a namespace handle, obtaining a handle to a variable using the namespace handle, determining the identity of each of a number of nodes and links associated with the namespace handle, obtaining a handle to each of nodes and links using the namespace handle, generating a segment which includes creating a second cursor in which the variable is bound to one of the nodes and links, and storing the segment.

The Application describes another aspect of the technology where a data structure includes a linked list that has a number of nodes and links. The linked list is a graph that is a collection of variables bound to the nodes and links in using a restriction. The restriction is a constraint graph.

The Application describes yet another aspect of the technology where a computerized system includes a directed labeled graph, an annotated schema runtime engine operably coupled to the directed labeled graph and a spider apparatus operably coupled to the annotated schema runtime engine, in which the spider interface includes at least one variable bound to a node or a link in the directed labeled graph, an annotated schema runtime engine, and interface to an annotated schema runtime engine cursor component.

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Cited References

The Office cites **Arefi** or **Moshfeghi** as its primary references in its anticipation and obviousness rejections. The Office cites **Hao, Ohsuga, Bentley,**

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and/or **Koenig** as its secondary references in its obviousness rejections. Below, Applicant discusses **Hao** of the several secondary references.

Arefi

Arefi describes an a technology that automatically generates object-oriented, syntax-directed editors for visual computer programming languages. The editors are language-sensitive or structured, which means that they have knowledge of the underlying programming language constructs and grammar.

Arefi uses a directed label graph (DLG) from program language. At page 355, col. 1, **Arefi** states that the operations that are "applied to the program at the position that is commonly called the *cursor* position." The cursor discussed by **Arefi** is logically equivalent to a cursor in a word processor or a text editor. It represents a single insertion point for operations are performed on the subject document. Indeed, the subject matter of **Arefi** are editors.

Moshfeghi

Moshfeghi describes a technology for browsing markup language documents from within the context of a client-server application running on an end-user device. Browser functionality, which is configured according to user profile information specifying each user's authorization and preferences, is embedded in the application, and can be activated by application controls.

While some users have unrestricted authorization and access, others are restricted to certain browser functions and to certain allowed network resources. This restriction is enforced by preventing the browser functionality from

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generating network addresses that are not on a list of allowed network addresses also present in the user profile information. Network access restriction is achieved, in part, by filtering markup language documents before display to delete linking information that is not allowed.

Document filtering methods are presented for Hypertext Markup Language (HTML) and extensible Markup Language (XML) documents. The document filtering methods are extendable to additional markup languages.

Hao

Hao describes a technology that enables single-screen visualization of hyperbolic space with multiple path links. In the preferred embodiment, the hyperbolic space is a display of a tree structure having nodes in which each child node has a single primary parent that is linked to the child node by a primary path. The nodes also include secondary paths. The system includes a multi-path processor that is used to manage three basic processing elements. As a first element, a multi-path property is added to each child node to indicate whether the child node has at least one secondary path in addition to its primary path. As a second element, an examiner checks each child node's multi-path property when a user focuses on that child node. If the node has at least one secondary path, the multi-path processor invokes the proper actions, such as mapping and unmapping. A third processing element is the mapper/unmapper which simultaneously maps and unmaps the secondary sub-tree nodes that are associated with the secondary path. Following the navigation of the secondary path, the multi-path processor

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reverses the operations, unmapping the sub-tree nodes and restoring the nodes to the original tree structure, simultaneously restoring the nodes.

Uses manual node-by-node navigation and individual character cursor ("text cursor"). They manually navigate paths.

Cursor

To clarify terminology, Applicant addresses the terminology of the term "cursor." Conventionally, there are two well-known types: Text Cursor and Database Cursor.

Typically, a *text cursor* is used in word processing and other text editing applications. A text cursor typically represents a single point in a text document. for the purpose adding/removing/editing text at that point. While **Arefi** discloses a visual editor, its cursor is analogous to a text cursor.

A traditional *database cursor* is, of course, typically used in databases. It is useful because it has the ability to be positioned on a given row for the purposes of examining, modifying or deleting a particular record from a database table. Given a position, such a database cursor may also be used to traverse or navigate the records in the table, for example, in order of one or more fields in the record.

The "cursor" recited in many of the pending claims are close akin to a "database cursor" than a "text cursor." So, just to clarify terminology, Applicant amends some of the pending claims to replace "cursor" with a more descriptive term, "spider cursor." To link this term to the existing terminology found in the specification, Applicant amends the specification to include this paragraph:

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Herein, references to "spider" is short for "spider cursor". In addition, the "cursor object" described herein may also be called the "spider cursor."

Unlike either "text" or "database" cursors, a spider cursor represents multiple points (on the graph). Applicant submits that use of this term does not change the scope of any of the claims. Rather, it merely clarifies and better illuminates the scope of the claims as they were already claimed.

Anticipation Rejections

Based upon Arefi

The Office rejects claims 24 and 25 under 35 USC § 102(b) as being anticipated by **Arefi**. Applicant traverses this rejection.

Claims 24 and 25

Both claims recite an "annotated schema runtime interface (IASR) cursor application program interface configured as a software module to interface with an annotated schema runtime engine."

Applicant submits that the Office has not shown, with particularity, where **Arefi** discloses, teaches, or suggests either an "annotated schema runtime engine" or an "interface" to such. Applicant submits that **Arefi** does not disclose, teach, or suggest such.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

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Based upon Moshfeghi

The Office rejects claim 23 under 35 USC § 102(e) as being anticipated by **Moshfeghi**. Applicant traverses this rejection.

Claims 23

This claim recites an "an annotated schema runtime interface (IASR) application program interface configured as a software module to interface with an annotated schema runtime engine and to handle requests from a client for a spider function; and an annotated schema runtime interface (IASR) cursor application program interface configured as a software module to interface with an annotated schema runtime engine and to handle requests from a client for a spider function."

The Office rejects these claims and indicates that all of the claimed features are disclosed in **Moshfeghi**. To support its position, the Office specifically refers to Fig. 1B; col. 7, lines 23-50 and Fig. 2; col. 9, 6-34.

Applicant submits that the Office does not point out, with particularity, where **Moshfeghi** discloses an "annotated scheme runtime engine." It also does not show where **Moshefeghi** discloses an "annotated schema runtime interface (IASR) application program interface configured as a software module" or an "an annotated schema runtime interface (IASR) cursor application program interface."

Applicant submits that **Moshfeghi** does not disclose, teach, or suggest an such things. Since it does not disclose these things, it also does not disclose that the interfaces are "configured as software module[s] to interface with the annotated scheme runtime engine."

According to the above reasons, Applicant asks the Office to withdraw its rejections.

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Obviousness Rejections

The Office Has Not Made Out a Case of Prima Facie Obviousness

Applicant disagrees with the Office's obviousness rejections and respectfully submits that the Office has not made out a *prima facie* case of obviousness. Accordingly, Applicant respectfully requests withdrawal of these rejections.

Based upon Arefi & Hao

The Office rejects claims 1, 3, 4, 8, and 16 USC § 103(a) as being unpatentable over **Arefi** in view of **Hao**. Applicant traverses this rejection.

Claim 1

With the portions of the references cited by the Office in brackets, this amended claim recites [with emphasis added]:

- generating the directed labeled graph; **[Arefi: p. 355, 1st col., 1st ¶]**
- generating a spider cursor of the directed labeled graph; **[Arefi: p. 355, 1st col., 2nd & 3rd ¶]** and
- navigating through the directed labeled graph using the spider cursor **[Hao: col. 5, lines 16-25).**

The Office indicates that it would have been obvious to one of ordinary skill in the art at the time of the invention (OOSA) to "include the feature of utilizing the cursor to traverse through the directed labeled graph in order to mark the current position of the graph."

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Applicant submits that neither **Arefi** nor **Hao** disclose a "spider cursor" as recited in this claim. Instead, they both disclose what is analogues to a "text cursor." They cursors represent a single point in an abstraction (e.g., a graph) for the purpose adding/removing/editing at that single point. See the discussion of "Cursor" above on page 22.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Claim 2

This claim is dependent upon a base claim (e.g., claim 1) and is allowable as depending from an allowable base claim. This claim is also allowable for its own recited features which, in combination with those recited their base claim, are neither disclosed nor suggested by the references of record.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Claim 3

With the portions of the references cited by the Office in brackets, this amended claim recites [with emphasis added]:

- generating a spider cursor of the directed labeled graph; **[Arefi: p. 355, 1st col., 2nd & 3rd ¶]** and
- navigating through the directed labeled graph using the spider cursor **[Hao: col. 5, lines 16-25).**

The Office indicates that it would have been obvious to one of ordinary skill in the art at the time of the invention (OOSA) to "include the feature of

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utilizing the cursor to traverse through the directed labeled graph in order to mark the current position of the graph."

Applicant submits that neither **Arefi** nor **Hao** disclose a "spider cursor" as recited in this claim. Instead, they both disclose what is analogues to a "text cursor." They cursors represent a single point in an abstraction (e.g., a graph) for the purpose adding/removing/editing at that single point. See the discussion of "Cursor" above on page 22.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Claims 4, 8, and 19-21

These claims are dependent upon a base claim (e.g., claim 3) and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited their base claim, are neither disclosed nor suggested by the references of record.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Claim 16

With the portions of the references cited by the Office in brackets, this amended claim recites [with emphasis added]:

- generating a spider cursor of a graph; **[Arefi: p. 355, 1st col., 2nd & 3rd ¶]**
- navigating in the graph using the spider cursor; **[Hao: col. 5, lines 16-25]** and
- retrieving data from nodes. **[Hao: col. 7, lines 4-8]**

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The Office indicates that it would have been obvious to one of ordinary skill in the art at the time of the invention (OOSA) to "include the feature of utilizing the cursor to traverse through the directed labeled graph in order to mark the current position of the graph."

Applicant submits that neither **Arefi** nor **Hao** disclose a "spider cursor" as recited in this claim. Instead, they both disclose what is analogues to a "text cursor." They cursors represent a single point in an abstraction (e.g., a graph) for the purpose adding/removing/editing at that single point. See the discussion of "Cursor" above on page 22.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Based upon Arefi, Hao, & Ohsuga

The Office rejects claims 2 and 17 USC § 103(a) as being unpatentable over **Arefi** in view of **Hao** and further in view of **Ohsuga**. Applicant traverses this rejection.

Claim 2

This claim is dependent upon a base claim (e.g., claim 1) and is allowable as depending from an allowable base claim. This claim is also allowable for its own recited features which, in combination with those recited their base claim, are neither disclosed nor suggested by the references of record.

In addition, the Office indicates that **Ohsuga** teaches that the directed labeled graph may be selected from a group consisting of conceptual schemas, metaschemas, and instance data. The Office cites col. 4, line 61 – col. 5, line 10 of **Ohsuga** for support.

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However, the cited portions of **Ohsuga** contain text covering introductory and housekeeping matters for the structure of the text of **Ohsuga.** It does not discuss or disclose anything about directed labeled graphs, conceptual schemas, metaschemas, and instance data. Moreover, Applicant's reading of **Ohsuga** failed to uncover any disclosure that indicated that a "direct labeled graph may be "selected from a group consisting of conceptual schemas, metaschemas, and instance data." Therefore, Applicant submits that **Ohsuga** does not disclose this feature.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Claim 17

With the portions of the references cited by the Office in brackets, this claim recites [with emphasis added]:

- generating a spider cursor of a graph; a storage device coupled to the processor, having graph data stored thereon, the graph data selected from the group consisting of conceptual schemas, metaschemas, and instance data; **[Ohsuga: col. 4, lines 61 thru col. 5, line 10]** and
- software means operative on the processor for:
  - generating a spider cursor of the graph data; **[Arefi: p. 355, 1st col., 2nd & 3rd ¶]** and
  - navigating through the graph data using the spider cursor **[Hao: col. 5, lines 16-25].**

The Office indicates that it would have been obvious to one of ordinary skill in the art at the time of the invention (OOSA) to "include the feature of utilizing the cursor to traverse through the directed labeled graph in order to mark the current position of the graph."

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The Office indicates that **Ohsuga** teaches that the directed labeled graph may be selected from a group consisting of conceptual schemas, metaschemas, and instance data. The Office cites col. 4, line 61 – col. 5, line 10 of **Ohsuga** for support.

However, the cited portions of **Ohsuga** contain text covering introductory and housekeeping matters for the structure of the text of **Ohsuga**. It does not discuss or disclose anything about directed labeled graphs, conceptual schemas, metaschemas, and instance data. Moreover, Applicant's reading of **Ohsuga** failed to uncover any disclosure that indicated that a "direct labeled graph may be "selected from a group consisting of conceptual schemas, metaschemas, and instance data." Therefore, Applicant submits that **Ohsuga** does not disclose this feature.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Based upon Arefi & Bentley

The Office rejects claim 10 USC § 103(a) as being unpatentable over **Arefi** in view of **Bentley**. Applicant traverses this rejection.

Claim 10

The Office indicates that **Bentley** teaches "an annotated schema runtime engine operably coupled to the directed labeled graph" as claim 10 recites. The Office cites col. 4, line 61 – col. 5, line 10 of **Bentley** for support.

However, the cited portions of **Bentley** contain text covering concepts of schemas, but it does not disclose an "annotated schema runtime engine" nor does it disclose one that is "operably coupled to the directed labeled graph." Moreover,

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Applicant's reading of **Bentley** failed to uncover any disclosure of such. Therefore, Applicant submits that Bentley does not disclose this feature.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Based upon Arefi & Koenig

The Office rejects claims 26-29 USC § 103(a) as being unpatentable over **Arefi** in view of **Koenig**. Applicant traverses this rejection.

Claims 26-29

These claims are dependent upon a base claim (e.g., claim 24) and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited their base claim, are neither disclosed nor suggested by the references of record.

According to the above reasons, Applicant asks the Office to withdraw its rejections.

Dependent Claims

In addition to its own merits, each dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each dependent claim where its base claim is allowable.

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Conclusion

All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application. If any issues remain that prevent issuance of this application, the Office is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

Dated: 6-4-04

By: _____

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